Specialist Engineering, Materials and Environmental Consultants

SPT 'N' VALUES vs Elevation

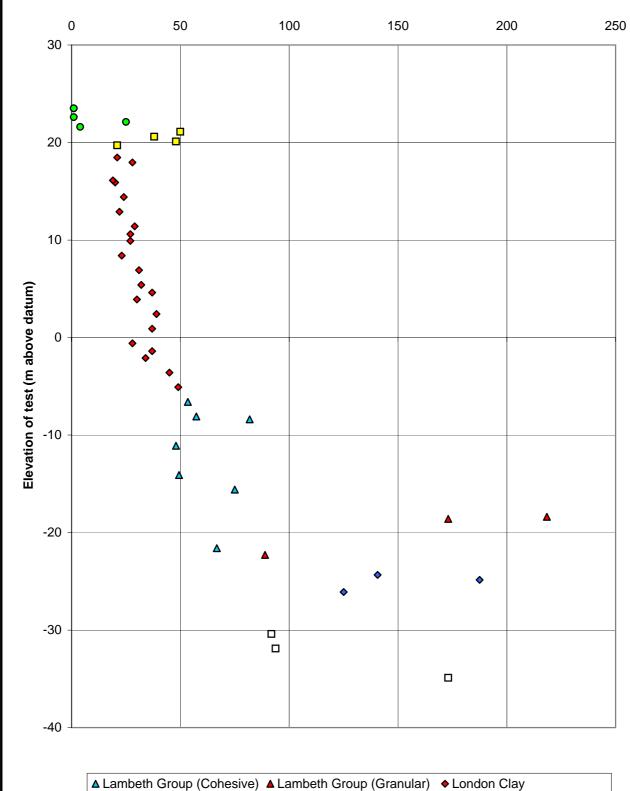
Denmark Place, London

Client: Consolidated Developments Limited

36237 Job Number:

Figure:





- Made Ground
- □ River Terrace Deposits
- ♦ Thanet Sand Formation

■ White Chalk

S	TAT	S

Specialist Engineering, Materials and Environmental Consultants

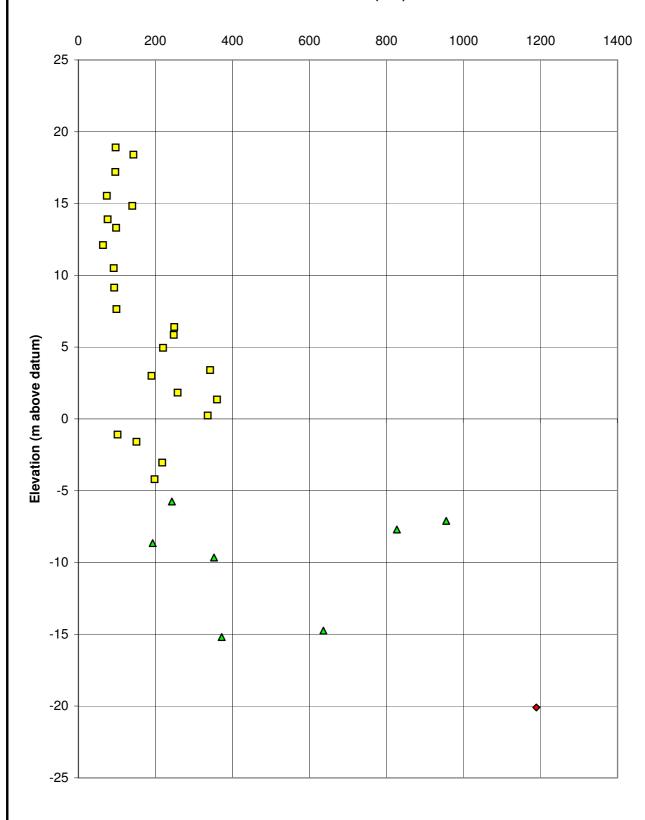
SHEAR STRENGTH vs ELEVATION

Site:

Denmark Place, London

Client: Job Number: 36237
Consolidated Developments Limited Figure: 4

SHEAR STRENGTH (kPa)



△ TX Lambeth Group (Cohesive) ◆ TX Lambeth Group (Granular) □ TX London Clay

5	M	S

Specialist Engineering, Materials and Environmental Consultants

MOISTURE CONTENT vs ELEVATION

Site:

Client:

Job Number:

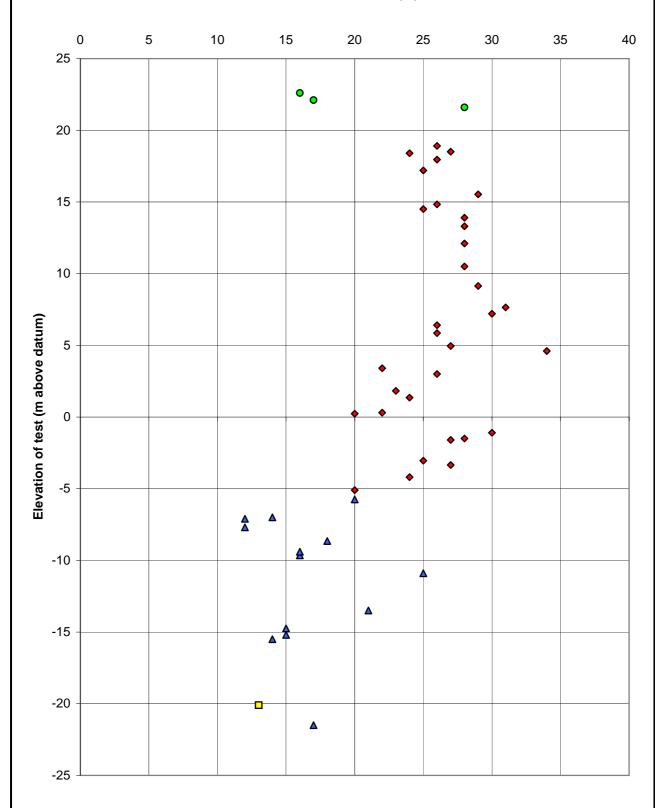
Denmark Place, London

Consolidated Developments Limited

Figure:

5

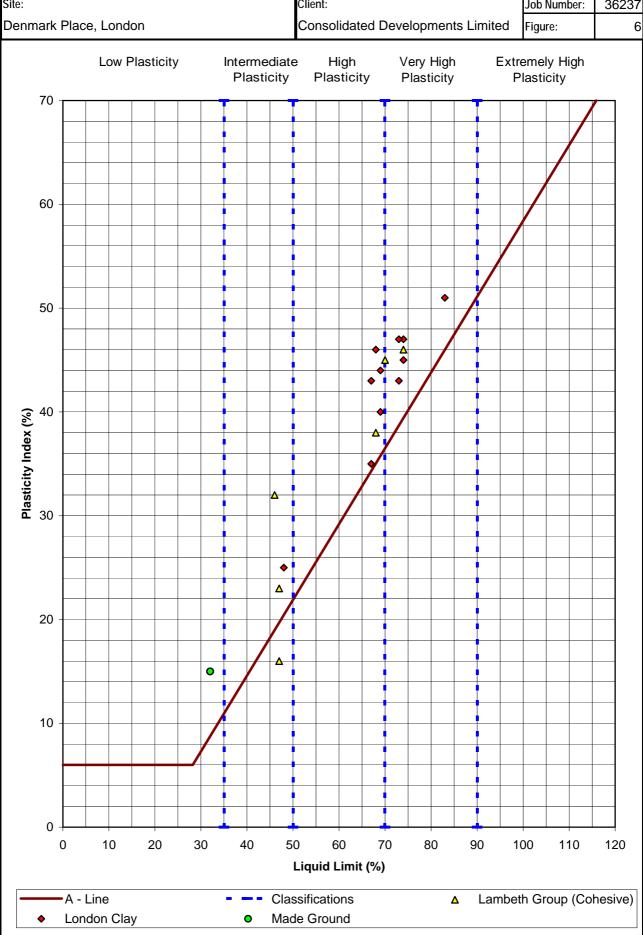
Natural Moisture Content (%)



Specialist Engineering, Materials and Environmental Consultants

PLASTICITY CLASSIFICATION **CHART**

Job Number: 36237



APPENDIX A

Fieldwork Records



APPENDIX A1

Borehole Records

(this appendix contains 14 pages including this one)



<u>S1</u>	<u>rat</u>	5						terials Iltants		REHOLE tary)	RECORD	Boreh Numb	
Site:									Easting	g:	Northing:		
Denn	nark Pla	ace							529867	7.9	181290.3	BH1	101
Clien									Ground	d Level:	Dates:	Job No.:	
		d Developi	mants	Limi	hati				25.10m		8 Apr 08	36237	
		Develop	mema			• • • • • •				CTDATA	15 May 08	Chart 4 a	
	Samples	SPT	FI	TCR	SCR	RQD		Level	Key	STRATA	Description	Sheet 1 c) /
Well	& Testing		(per m)		(%)	(%)	(m)	(mAOD)			· 		
	B1 0.25						0.25	24.85			: Grey unreinforced concrete. : Brick wall and brick wall rubb	la with appaiana	
	J1 TB1 _{0.50} J2 TB2						0.70	24.40		blue and white ch smoking pipe frag	nina fragments, ceramic tiles argments. Bricks are predominar r sandstone bricks towards the	nd clay itly red with	" _/
	D1 0.90 B2 1.00 J3 TB3						1	<u>-</u> - -		subangular fine to	: Brown slightly sandy very cla coarse gravel of red brick fragete, whole bricks and coal frag	gments with	
	J4 1.50 TB4 1.60									medium to coarse at 0.75m de	e. epth, animal bone.		
	TB4 1.60 D2 B3	s _T									epth, bone fragments. m depth, very loose dark browr	١.	
		N=1					2	-					
	D3 2.50 B4 J5	sT									n depth, grey brown with occa-	sional angular	
	TB5	N=1								fine yellow sai	ndstone brick fragments.		
	D4 3.00						3				m depth, occasional subangula		
	B5 3.50	S T					3.50	21.60		clay.			
	∘ D5 J6 ∘ TB6						0.00	=		gravelly clay. Sar	: Very soft to soft slightly sand nd is fine to coarse. Gravel is a	ngular to	
	D6 4.00	N=4					4	_		subangular fine to fragments.	o medium flint and red/yellow b	rick	
]					
	B6 4.50 J7	c_T					4.40	20.70	* * * * * * * * * * * * * * * * * * *		htly silty sandy angular to subraVEL. Sand is medium to coa		•
	TB7	N=38							× × × ×	TERRACE DEPC		oo. (ITIVEIT	
	D7 5.00						5		× × ×				
	B7 5.40 J8 5.50	c _T							××××	below 5 40r	m depth, medium dense.		
	TB8	N=21							×	below 3.401	ii deptii, medidiii dense.		
	D8 6.00						6.00 6	19.10	<u> </u>				
	J9 6.20 TB9										rlaminated orange brown CLA prown/black laminae <1mm. (L		
	D9 6.50						6.50	18.60		Firm and stiff indi	stinctly fissured locally thinly la	minated	,
	U1 6.70									arev CLAY with a	ccasional shiny speckles <1m gs up to 1mm of light grey silt.	m of selenite and	
	D10 7.10 D11 7.15						7	_		CLAY)			
	7.13			NR				-					
		N=28					7.70	17.40		Otiti I III - til-i I -	la !	. L.	
	U2 7.90						8			fissured grey CLA	laminated closely to very close AY with occasional shiny speck	les <1mm of	
	D12 8.30									(LONDON CLAY)	sional light grey silt partings <)	imm.	
				100					E				
								-					
							9	-					
		s _T						=					
	U3 9.57	N=20						1	===				
	D13 9.90			100				=		Continued ne	ext sheet		
		l Water Ob										Scale:	1:50
										ussion BH diame		Logged by:	JB
4.40 -	6.00m.	Water enco	untere	ed at 8	5.60m	deptl	h - no ri	se. Casi	ing left in	the hole for rotar		Figure:	A1
IOHOW	on. Ged	bore S rota	ary cor	eu Wi	แเ พลเ	ei ilo	m 7.10l	11 10 03.	oom dept	11.			$\Delta 1$

2	Al	5					g, Mat Consu			ary)	RECORD	Number						
Site:									Easting	-	Northing:							
Denm	ark Pla	ce							529867	7.9	181290.3	BH101						
Client		Dovolope	manta	Limi	tod				Ground 25.10m	d Level: nAOD	Dates: 8 Apr 08	Job No.: 36237						
		Developr	nents			ANDI	F0		2011011		15 May 08							
	HOLE Samples	SPT	FI	TCR	SCR	AMPL RQD	Depth	Level	Key	STRATA	Description	Sheet 2 of 7						
Well	& Testing	'N' Value	(per m)		(%)	(%)	(m)	(mAOD)		Stiff locally thinly	laminated closely to very closel	v						
	U4 10.27 D14 10.60	S +					- - -	-		fissured grey CLA	AY with occasional shiny speckl sional light grey silt partings <1	es <1mm of						
	U5 11.20	N=24					11 –											
	D15 11.60 U6 11.80			100			-			below 11.50	11.50m depth, closely to extremely closely fissured							
	D16 12.20	S —					12-	-		at 12 40m d	lepth, 50mm fragment of moder	ratoly weak grov						
	U7 13.00	N=22		91			13 –			mudstone	epiti, 30mm nagment of model	ately weak grey						
	D17 13.35						-											
		S N=29					14 –	1 - - - -										
	D18 14.30 U8 14.60			87			-	-										
	D19 15.00	SŢ					15 -											
	D20 15.80 U9 15.96	N=27		87			16				.62m and 15.70m depth, occas it grey mudstone	ional fragments of						
		S T					- - - -	- - - - -		grey mudstone between 16	.42m and 16.5m depth, modera							
		N=23					17 - -	- - - - - -		moderately str	ong light grey mudstone							
	U10 17.46 D21 17.90			71			-		==== =====									
		SŢ					18 – - - -	- - - - -										
	U11 18.70 D22 19.10	N=31		100			19 –	- - - - - -		below 18.70	Om depth, very stiff							
	U12 19.25 D23 19.65	s _T					-											
		W-: 2:		<u>. </u>	L		-	1		Continued ne	ext sheet	Canlar						
		Water Ob				rices e	encount	ered. C	able perc	ussion BH diame	eter	Scale: 1:50						
200mr	n to 7.60	m depth a	nd cas	sing di	iamete	er 200	mm to 7	7.00m c	lepth. 30	gallons water add the hole for rotar	ded	Logged by: JB						
		bore S rota									У	Figure: A1						

<u>S1</u>	AT	S s	Specia and E	alist L Envir	Engin onme	eerin	g, Mate Consul	erials Itants		REHOLE tary)	RECORD	Boreho Numbe	
Site:									Eastin	g:	Northing:		
Denm	ark Pla	ce							52986	7.9	181290.3	BH1	01
Client									Groun	d Level:	Dates:	Job No.:	
Consc	lidated	Developr	nents	Limi	ted				25.10r	mAOD	8 Apr 08 15 May 08	36237	
BORE	HOLE			СО	RE S	AMPL	.ES			STRATA		Sheet 3 of	7
Strike &		SPT	FI (nor m)	TCR	SCR	RQD	Depth	Level (mAOD)	Key		Description		
Well	& Testing U13 20.15	'N' Value N=32	(per m)	(%)	(%)	(%)	(m) - -	(MAOD)		fissured grey CLA	laminated closely to very closely	es <1mm of	
	D24 20.50			100			- - -	- - -		(LONDON CLAY)	sional light grey silt partings <1	nin.	
							-						
		s _T					21 —						
		N=30					=			at 21.35m d	epth, 5mm pyrite rich nodule		
	U14 21.70						-				epth, 5mm thick very weak light	grey mudstone	
	D25 22.05 U15 22.10			100			22 –			bclow 21.70	an depth, locally hard		
							_ _ _						
		s _T					-						
		N=39					23						
	U16 23.28						-						
	D26 23.60			93									
	U17 23.75						- 24 <i>-</i> -	_					
	D27 24.10	s _T					24			silt partings up	n depth, dark grey with occasion to 3mm thick and occasional li	ght brown	
		N=37		orm' holes up to 2mm thick by 2	:0mm long								
	D28 24.80 U18 24.87						-						
	010 24.07			93			25 —						
							-						
		s⊤					-		<u> </u>				
		N=28					26						
	U19 26.20			400			-	-					
	D29 26.60 U20 26.70			100			-	-					
							27 -						
	D30 27.10	s _T											
		N=34					-						
				100			-						
	U21 28.15			100			28 –	- - -					
	D31 28.45						-						
		s⊤					-	-					
		N=45					29 —	-					
	U22 29.30						- -						
	D32 29.70			100			- - -						
							_	1		Continued ne	ext sheet		
		Water Ob							_ - -		4	Scale:	1:50
200mm	n to 7.60	m depth at	nd cas	sing di	iamete	er 200	mm to 7	7.00m c	lepth. 30	cussion BH diame gallons water ad	ded	Logged by:	JB
		Nater enco bore S rota								the hole for rotar th.	у	Figure:	A1

TAT	5					ng, Mate Consul			REHOLE tary)	RECORD	Borehole Number
te:								Easting	<u> </u>	Northing:	
enmark Plac	ce							529867	7.9	181290.3	BH10
ient:								Ground	d Level:	Dates:	Job No.:
nsolidated	Develop	ments	I imit	ed				25.10m		Dates: 8 Apr 08 15 May 08	36237
DREHOLE	2010.ор.			RE SA	MPI	LFS			STRATA	A RECORD	Sheet 4 of 7
ke & Samples	SPT	FI	TCR	SCR	RQD	Depth	Level	Key	• • • • • • • • • • • • • • • • • • • •	Description	0
ell & Testing D33 30.20	'N' Value	(per m)	(%)	(%)	(%)	(m) 30.10 - 30.25 _	(mAOD) -5.00 -5.15	· · · · · · · · · · · · · · · · ·	\ fissured grey C	ly laminated closely to very clo LAY with occasional shiny spe casional light grey silt partings	ckles <1mm of
	⊥ N=49					30.50	-5.40		\ \ (LONDON CLA	Y)	
U23 30.85 D34 30.90			83			31 —			rounded fine to	nottled dark green grey CLAY medium flint and occasional d n. (LONDON CLAY BASAL BE	ark grey silt
						-			Very stiff green	grey mottled orange brown CL shell fragments. (UPPER SHE	_AY with many
D35 31.70	s _T					-			Hard and friable	e locally very stiff red brown mo	ottled green
D36 32.10	 50/215mm					32 -			green grey sligt	n occasional partings of green on the sandy silt. Sand is fine. (UI) NG FORMATION, LAMBETH G	PPER MOTTLED
U24 32.20			0.7			-			DEDO, NEADII	NO FORMATION, EANIBETITE	
			97			-					
U25 32.80						33-				32.7m and 35.0m depth, with n thin beds of green grey very sil	
D37 33.20	s _T					-					
	_L 50/190mm					-					
U26 33.75						-					
			100			34 —					
D38 34.50						-					
U27 34.75						-					
			80			35 —					
						-					
			80			-					
D39 36.00						36-					
	s _T										
	 39/200mm					-					
			120			-					
D40 37.20						37 – 37.15	-12.0				
D40 37.20			100			-			mid to dark gre	n hard and friable locally thinly to CLAY (UPPER MOTTLED BLAMBETH GROUP) AMBETH GROUP) AMBETH GROUP AMBETH GROUP AMBETH AMBET	
						-			FORWATION, I	LAMBETH GROUP)	
						38		<u> </u>			
			94			=					
D41 38.60						-					
			100			38.85 <u> </u>	-13.7		Hard (locally ve	ery stiff) closely to extremely clo	osely
	s⊤		100			39 -			fissured locally grey, red brown	thinly laminated multicoloured n, orange) CLAY with occasion	(purple, al thin beds to
	50/275mm		NR			1 -			READING FOR	f very silty fine sand. (UPPER I)
D42 39.80 U28 39.85						=				39.0m and 39.3m depth, with s 2mm - probably disintegrated s	
marks and	Water Oh	serva	tions				<u> </u>		Continued I	IOAL SHEEL	Scale:
	ection pit t			servi	ces e	encounte	ered. C	able perc	ussion BH dian	neter	1:8
									gallons water a		Logged by:

<u>S1</u>	AT	S 9					ng, Mat Consu			REHOLE ary)	RECORD	Borehole Number
Site:									Easting	j :	Northing:	
Denm	ark Pla	ce							529867	7.9	181290.3	BH101
Client	:								Ground	d Level:	Dates: 8 Apr 08	Job No.:
Consc	lidated	l Developi	ments	Limi	ited				25.10m	nAOD	15 May 08	36237
BORE	HOLE			CO	RE S	AMPI	LES			STRATA	RECORD	Sheet 5 of 7
Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key		Description	
Von	U29 40.30 D43 40.60	S	(per iii)	100	(70)	(76)	41 —			fissured locally th grey, red brown, thick laminae of v	stiff) closely to extremely clos inly laminated multicoloured (p orange) CLAY with occasional ery silty fine sand. (UPPER M (ATION, LAMBETH GROUP)	urple, thin beds to
	D44 42.20 U31 42.25			100			41.30	-16.2		slightly silty fine S	interlaminated light grey and I SAND. (LAMINATED BEDS, W MBETH GROUP)	ight brown OOLWICH
	U30 42.95			97			43-		X X X X X X X X X X X X X X X X X X X			
	D45 43.70	S = 50/30mm		67			44					
	D46 44.80 D47 45.10 U32 45.20						45 – 45.10	-20.0	× × × × × × × × × × × × × × × × × × ×	fine SAND. (LAM	y thinly laminated dark grey br INATED BEDS, WOOLWICH I	
	U33 45.90			100			45.50	-20.4		laminated multico purple, red brown occasional fine sa	JP) issured locally thinly to thickly cloured (mottled green grey, gr and orange brown) sandy CL and pockets and partings to 5m DTTLED BEDS, READING FO	AY with nm. Sand is
	D48 46.60	S48/160mm					47.05 ⁴⁷	-21.9		below 46.3r sand within cl at 46.5m de	n depth, with occasional dark g ay and within sand pockets and pth, 20mm rounded flint pebbl	d partings e
	D49 47.70 U34 47.75			100			-			dark grey mottled	interbedded to thinly interlami dark green fine SAND and ligi OR FORMATION, LAMBETH	nt grey silty
	U34 47.75			100			48 -	- - - - -		rounded fine t between 48	.85m and 47.95m depth, with so coarse flint gravel washed on .1m and 48.35m depth, with so coarse flint gravel washed on	ut of matrix ubrounded to
				57			48.80 49-	-23.7	× × × × × ×		green grey silty fine SAND. (Th .80m and 49.20m depth, no re	
	D50 49.25			31 NB			-	-				
		S ±		NR					x x x	Continued ne	ext sheet	T
		Water Ob				ilooo a	ancount	ared C	able nore	ussion BU diama	otor	Scale: 1:50
200mn	n to 7.60	m depth a	nd cas	sing d	iamet	er 200	mm to 7	7.00m d	depth. 30	ussion BH diame gallons water ad	ded	Logged by: JB
		Nater enco bore S rota								the hole for rotar h.	У	Figure: A1

<u>S1</u>	AT	S s					ng, Mate Consul		(Ro	tary)	RECORD	Boreho Numbo	
Site:	and Dia								Eastin 52986	_	Northing: 181290.3	BH1	01
Client	nark Pla 	ce							Group	d Level:	Dates	Job No.:	
		Developr	nents	limi	ted				25.10r		Dates: 8 Apr 08 15 May 08	36237	
	EHOLE	Вечеюрі	HOHIO		RE S	ΔΜΡΙ	IFS			STRATA I	-	Sheet 6 o	f 7
	Samples	SPT	FI	TCR	SCR	RQD	Depth	Level	Key	OINAIAI	Description	Officer o o	. ,
Well	& Testing	'N' Value 50/45mm	(per m)	(%)	(%)	(%)	(m) -	(mAOD)	X X X	Remaining Detail	: 49.70m - 49.70m :between	n 49.7m and	
				NR 43			51 —			50.65m depth, nobetween 50 medium to coa		unded to rounded	d
	B8 51.30	S ± 50/50mm		100			- -		^		.05m and 51.20m depth, very of	disturbed recovery	y
	U35 51.50			83			=		× × × × × × ×				
	U36 52.05			100			52 -		x				
	B9 52.50			71			-		X X X X				
				NR			52.80 <u>-</u> 53 –	-27.7	0 0 0 0	No recovery - larg	ge flint cobbles (BULLHEAD BE	EDS)	
							53.50	-28.4	0 0 0 0	flints pushed of	.10m and 55.50m depth, poor down at end of coring bit. ely strong, medium density, wh	•	
				14			54 — - - - -			Fractures are nea	ar horizontal, closely to extreme 0) infilled (1,2,3) with white cor	ly closely	
				20			55 —						
	C1 55.73	S ⊥ _{50/95mm}	11	73	27	27	56 —			between 55	.90m and 56.10m depth, no red	covery	
		s _T	23	100	35	35	57—						
		50/115mm					57.30 -	-32.2			.0m and 57.35m depth, non int		
	C2 57.42		5	93	52	45	58 —			pale grey staining (100,275,500) tigl clay/smear or slig between 58	to strong, medium density whit y CHALK. Fractures medium to ht, clean (1,2,3) to infilled with intly stained orange brown. (GF .10m and 58.50m, poor recover if flint cobbles up to 100mm.	closely spaced grey RADE A,B/2,3)	ar
	C3 58.95 C4 59.45		6	93	80	61	59 — - - - - - -						
Remarks and Water Observations									<u> </u>	Continued ne	ext sheet	Scale:	
Hand	dug insp	ection pit to	1.50	m - n	o serv					cussion BH diame			1:50
200mr	n to 7.60)m depth ai	nd cas	ing di	iamete	er 200	mm to 7	7.00m c	depth. 30	gallons water add the hole for rotar	ded	Logged by:	JB
		bore S rota									,	Figure:	A1

Ite: Idenmark Place Illent: Incremark Place Illent: In	TAT	Number Number
Semantal	e.	ı
Simples SPT FI RS SCR RQD Depth (MADD) Season Seas		BH101
Considerated Developments Limited Constant Cons		Job No.:
Correction Section S		36237
Remaining Detail : 59.70m - 59.70m :between 59 59.90m depth, with 180mm long rinded flint cobble between 60.60m and 60.88m depth, rinded flint cobble between 60.60m and 60.88m depth, rinded flint density between 61.90m depth, somm flint cobble between 61.90m depth, somm flint cobble between 61.90m depth, fractures are widely to clis spaced (GRADE A,Brl, 2,3) between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in comminuted children between 62.60m and 62.72m depth, indeed are coarse flint gravel and cobbles in coarse flint gravel and cobbles in coarse flint gravel and	OREHOLE	Sheet 7 of 7
Second S	ke & Samples	
	C5 60.30 C6 61.50 C7 62.32	int cobbles rong, very closely
emarks and Water Observations	emarks and	Scale: 1:50
and dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter		odded by:
.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary	10 - 6.00m. '	Figure: A1

Borehole BOREHOLE RECORD Specialist Engineering, Materials (Rotary - Open Hole) Number and Environmental Consultants Easting: Northing: **BH102** 529866.3 181289.8 Denmark Place Dates: 9 Apr 08 Client: **Ground Level:** Job No.: 25.11mAOD 36237 Consolidated Developments Limited 25 Apr 08 **CORE SAMPLES BOREHOLE** STRATA RECORD Sheet 1 of 6 SPT Strike & Samples FI TCR SCR RQD Depth Level Description Well & Testing 'N' Value per m (%) (%) (%) (m) (mAOD) 25.06 0.05 MADE GROUND: Tarmac. 0.25 24.86 MADE GROUND: Grey unreinforced concrete. J1 TB1 B1 J2 TB2 0.50 0.50 24.61 MADE GROUND: Brown silty very sandy angular to subangular fine to coarse gavel of brick fragments with occasional whole bricks, concrete fragments, flint and coal. Sand is fine to 0.70 MADE GROUND: Soft to firm dark brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular to 1.40 subangular fine to coarse brick and concrete with occasional coal fragments, clay cigarette pipes and animal bones. ...below 1.40m depth, mottled orange brown. 1.60 S TB3 D2 ВЗ N=1 2 2.50 J4 TB4 2.95 3.00 3 3.20 21.91 MADE GROUND: Firm orange brown slightly sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine 3 50 21 61 to coarse flint with occasional red brick fragments TB5 D5 3.60 Very dense brown slightly silty sandy angular to subrounded fine to coarse flint GRAVEL. Sand is medium to coarse. (RIVER B5 4.00 S TERRACE DEPOSITS) D6 J6 TB6 4.50 B6 5.00 С 5 ...below 5.00m depth, dense. 5.50 TB7 D7 6.00 6.00 6 19.11 Firm locally thinly laminated orange brown CLAY with U2 J8 TB8 occasional dark brown/black laminae <1mm. (LONDON CLAY) 6.50 18.61 6.60 6.65 Firm (locally stiff) indistinctly fissured locally thinly laminated grey CLAY with occasional shiny speckles <1mm of selenite and occasional partings up to 1mm of light grey silt. (LONDON CLAY) 7 N=21 7.50 17.61 (LONDON CLAY) 8

Remarks and Water Observations

S

Hand dug inspection pit to 1.60m - no services encountered. Cable percussion BH diameter 200mm to 7.50m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 3.50 - 6.00m. Water 10/04/08 pm, 4.40m, 11/04/08 am 4.00m, casing at 5.00m. Casing left in the hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure

9

 Scale:
 1:50

 Logged by:
 JB

 Figure:
 A1

..between 9.00m and 9.45m depth, stiff grey CLAY with

occasional shiny speckles <1mm of selenite

Continued next sheet

metre tests. Strata boundaries inferred from Driller's Descriptions and from BH101 strata.

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Strike & Samples Simples Simpl			Develop	ments	: I imi	ted						Dates: 9 Apr 08		
State & Samples SPT (N) Value for m (N)			2010.00				ΔМРІ	FS			STRATA		Sheet 2 o	of 6
Remarks and Water Observations Remarks and Water Observations			SPT	FI						Key	0110/11/1		0110012	51 0
between 14.50m and 14.55m depth, stiff grey CLAY with occasional shiry specides														

5	AT	S s					g, Mate Consul			REHOLE tary - Op	RECORD en Hole)	Boreh Numb	
Site:									Easting	~	Northing:		
Denm	ark Pla	ce							52986	6.3	181289.8	BH'	102
Client	:									d Level:	Dates: 9 Apr 08	Job No.:	
Consc	olidated	Develop	ments	Limi	ted				25.11n	nAOD	25 Apr 08	36237	
BORE	HOLE		1	СО	RE S	AMPL	ES	ı	1	STRATA	RECORD	Sheet 3 c	of 6
Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key		Description		
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		s _T					-			hotwoon 20	.50m and 20.95m depth, very	atiff arou CLAV	
		N=37					- -				al shiny speckles <1mm of sel		
		14-57					21 -						
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		S —					-			between 26	.50m and 36.95m depth, very al shiny speckles <1mm of sel	stiff grey CLAY	
		⊥ N=37					27 —			with occasione	ar string speckles < frill or ser	eriite)	
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Hand o	dug insp	ection pit to	0 1.60	m - no	serv					ussion BH diame		Logged by:	
3.50 -	6.00m. \	Nater 10/0	4/08 p	m, 4.4	10m, 1	11/04/	08 am 4	.00m, d	casing at	gallons water ad 5.00m. Casing le	ft in		JB
the ho	le for rot	ary follow	on. Op	en ho	led us	sing w	ater to 5	54.00m	depth for	r 9 in-situ pressur o m BH101 strata.	e	Figure:	A1

STAT	5 s					ng, Mat Consu			REHOLE tary - Ope	RECORD en Hole)	Numb	
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Client:								Ground	d Level:	Dates: 9 Apr 08	Job No.:	
Consolidated	Develop	ments	Limi	ted				25.11n	nAOD	9 Apr 08 25 Apr 08	36237	
BOREHOLE			СО	RE S	AMPI	LES			STRATA I	RECORD	Sheet 4 c	of 6
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		(50)	(70)	(70)	(70)				(LONDON CLAY)			
						30.25	-5.14 -5.39			BEDS, LAMBETH GROUP)		
						-			(UPPER MOTTLE GROUP)	ED BEDS, READING FORMA	TION, LAMBETH	
						31 -						
						-						
						32 -						
						-						
						33 -						
	s⊤											
	 50/145mm					-				33.73m depth, very stiff to hallue grey CLAY)	d red brown	
						34						
						-						
						35-						
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						-	<u> </u>	<u></u>	Continued ne	ext sheet		
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200mm to 7.50	m depth a	nd cas	sing di	iamete	er 200	mm to	7.00m c	lepth. 30	gallons water ad	ded	Logged by:	JB
the hole for rota	ary follow o	on. Op	en ho	led us	sing w	ater to	54.00m	depth for	5.00m. Casing le 9 in-situ pressur m BH101 strata.		Figure:	A1

SIAI	Specialist Engineering, Materials and Environmental Consultants					tary - Ope	RECORD en Hole)	Numb				
Site:								Eastin	g:	Northing:		
Denmark Pla	ice							52986	6.3	181289.8	BH1	02
Client:									d Level:	Dates: 9 Apr 08	Job No.:	
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BOREHOLE					AMP	T			STRATA I		Sheet 5 o	f 6
Strike & Samples Well & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key		Description		
						41 -			(UPPER MOTTLE GROUP)	ED BEDS, READING FORMA [*]	ΓΙΟΝ, LAMBETH	
						41.30	-16.2		(LAMINATED BEI	DS, WOOLWICH FORMATIO	N, LAMBETH GR	OUP)
	S == 50/30mm					43 -				.50m and 43.60m depth, very t grey and light brown silty fine		
						45 - 45.50 46 -	-20.4	× × × × × × × × × × × × × × × × × × ×	(LOWER MOTTLI GROUP)	ED BEDS, READING FORMA	TION, LAMBETH	
	S					47.05 ⁴⁷ - 48 -	-21.9		between 47 coarse glauco	TION, LAMBETH GROUP) .40m and 47.65m depth, very nitic SAND over very stiff brow AY with silt laminae.		to
	S					48.80 49 -	-23.7		lost (Driller's D (THANET SAND)	.45m and 49.61m depth, very).		/
Remarks and	Water Ob	serva	ations	<u> </u>	1	1	1	ixtrii - (X J.J.)			Scale:	1:50
Hand dug insp	ection pit to	0 1.60	m - no	serv					ussion BH diamet		Logged by:	
3.50 - 6.00m. \	Water 10/0	4/08 p	m, 4.4	40m, 1	11/04/	'08 am 4	1.00m, d	casing at	gallons water add 5.00m. Casing le	ft in	Figure:	JB A1
the hole for rol	ne hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure A1 A1 A1 A1 A1											

STA	15					ng, Mate Consul					Numb	
Site:								Eastin	_	Northing:		100
Denmark	Place							52986	6.3 	181289.8	BH1	102
Client:	ited Develor	ments	e Limi	ted				Groun 25.11r	d Level: nAOD	Dates: 9 Apr 08	Job No.: 36237	
BOREHO)IIIGIII		RE S	۸MDI	ES			STRATA	25 Apr 08	Sheet 6 c	vt 6
Strike & Sam		FI	TCR	SCR	RQD		Level	Key	JINAIA	Description	Sileet o C) O
Well & Te	eting 'N' Value	(per m	(%)	(%)	(%)	51 – 52 – 52 – 53.30 – 54.0064 – 55 – 56 – 57 – 57 – 58 – 59 – 59 – 59 – 59 – 59 – 59 – 59	-27.7 -28.2		(WHITE CHALK) (WHITE CHALK) End of Boreh	•	Saala	
	and Water O				i	noc:::-1		able =	region DLL -!:	tor	Scale:	1:50
200mm to	7.50m depth	and cas	sing d	iamete	er 200	mm to 7	7.00m d	depth. 30	ussion BH diame gallons water ad 5.00m. Casing le	ded	Logged by:	JB
the hole fo	r rotary follow	on. Op	en ho	led us	sing w	ater to 5	54.00m	depth for	· 9 in-situ pressur · m BH101 strata.		Figure:	A1

APPENDIX A2

Core Photographs

(this appendix contains 20 pages including this one)





Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



Job No:	36237	
Fig No:	Appendix A2	



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



Job No:	36237	
Fig No:	Appendix A2	



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



Job No:	36237	
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Site:	Denmark Place	Client:	Consolidated Developments Limited
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Job No: 36237



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph

Fig No:



CORE PHOTOGRAPH

Job No:	36237	

Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



Job No:	36237	
Fig No:	Appendix A2	



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



Job No: 36237



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



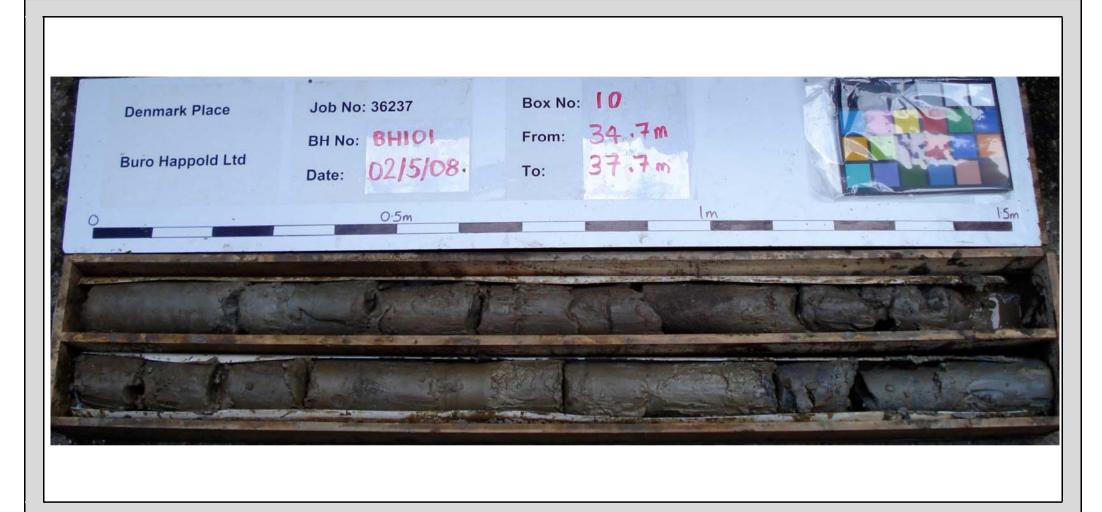
Job No: 36237



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Site:	Denmark Place	Client:	Consolidated Developments Limited
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Site:	Denmark Place	Client:	Consolidated Developments Limited
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Job No: 36237



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



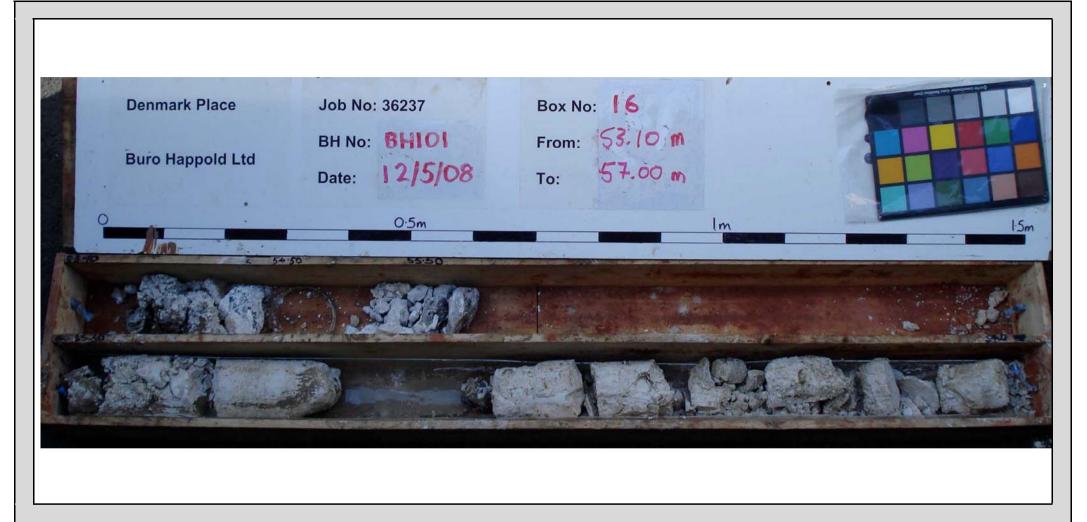
Job No: 36237



Site:	Denmark Place	Client:	Consolidated Developments Limited
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Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



Job No: 36237



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph

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CORE PHOTOGRAPH

Job No:	36237

Appendix A2



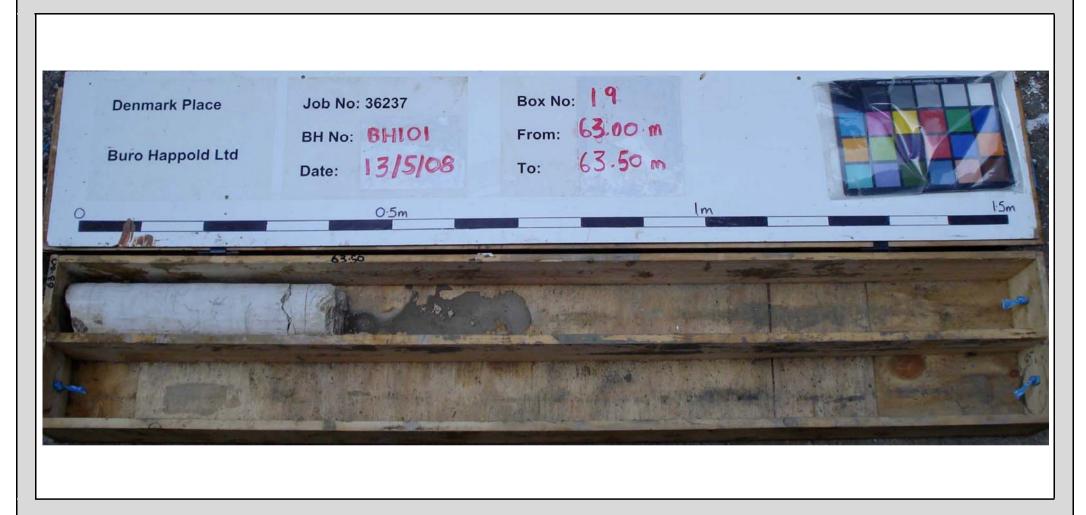
Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No: 36237

Fig No: Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No: 36237

Fig No: Appendix A2

APPENDIX A3

Cambridge Insitu Pressuremeter Testing Report and Data

(this appendix contains 1 CD and 1 page including this one)



DENMARK PLACE GROUND INVESTIGATION

Results of self bored pressuremeter tests carried out by Cambridge Insitu Ltd

Our reference: CIR1194

Main contractor reference: 36237

Report date: June 2008

Volume 2 of 2

Plots and data for tests in BH102

CAMBRIDGE INSITU LTD

Little Eversden Tel: +44 1223 262361 Cambridge Fax: +44 1223 263947

ENGLAND Email: caminsitu@btconnect.com CB23 1HE HTTP: www.cambridge-insitu.com

Contents of Volume 2

Included tests

Test	Date	Depth	Probe	Remarks
		(mBGL)		
B102 T1	15-Apr-08	8.5	WRSBP6	London Clay
B102 T2	15-Apr-08	14.0	WRSBP6	London Clay
B102 T3	16-Apr-08	20.0	WRSBP6	London Clay
B102 T4	16-Apr-08	26.0	WRSBP6	London Clay
B102 T5	17-Apr-08	33.0	WRSBP6	Lambeth Group - reddish/grey clay
B102 T6	18-Apr-08	43.0	WRSBP6	Lambeth Group - layered sand/green clay
				Sandy gravely blue/green silt - probably
B102 T7	21-Apr-08	47.9	WRSBP6	Upnor Beds
B102 T8	22-Apr-08	50.0	WRSBP6	Thanet Sand - some gravel in the hole
B102 T9	22-Apr-08	51.0	WRSBP6	Thanet Sand - drilled on from test 8

This volume is laid out as follows:

- A summary section showing various parameters plotted against depth. This starts with a plot showing the field curves of all tests on common axes of pressure and displacement.
- b) A detailed presentation of the shear modulus information gathered from unload/reload cycles. Some of these are summary plots.

This is then followed by the analysis data for the individual tests. For each test there are the following pages in approximately the following order:

- 1. A Results Summary Sheet
- 2. A plot of Total pressure/Cavity strain
- 3. Where appropriate, a plot on axes of Average Radial Displacement/ Total pressure showing the choice of cavity reference pressure suggested by initial cavity movement ('Lift-off' analysis).
- 4. A plot on axes of Average Radial Displacement/ Total pressure showing the Marsland & Randolph (1977, modified) construction.
- 5. Where appropriate, a plot on axes of pore pressure vs total pressure showing the development of excess pore pressure during the test and identifying, where possible, the cavity reference pressure from the onset of cavity expansion.
- 6. For undrained tests, a plot on axes of Ln[current cavity shear strain]/Total Pressure showing loading data and the use of the perfectly plastic solution to obtain the undrained shear strength and limit pressure (after Gibson & Anderson, 1961)
- 7. A plot on axes of Ln[current cavity shear strain]/Total Pressure (unloading) showing contraction data and the use of the perfectly plastic solution to obtain the undrained shear strength (after Jefferies, 1987).
- 8. For undrained tests, a plot of shear stress vs shear strain for the expansion phase of the test using the procedure suggested by Palmer (1972).
- 9. For undrained tests, a plot of shear stress vs shear strain for the contraction phase of the test using the procedure suggested by Palmer (1972).
- 10. For drained tests, a plot on axes of Ln[cavity strain]]/Ln[Effective radial stress]showing the peak angle of internal friction and dilation (Hughes et al,

1977).

- 11. Plots on axes of Radial displacement/Total Pressure showing enlarged views of unload/reload cycles and quoting shear modulus G
- 12. Plots on axes of Ln[current cavity shear strain]/Ln[Total Pressure] showing loop reloading paths and quoting the gradient and intercept for each loop.
- 13. A plot on axes of secant shear modulus/Log[Shear strain] showing the decay of stiffness against strain curves derived from fitting a power law function to reloading data, all cycles. Individual data points obtained from applying Palmer (1972) directly to reloading data are also shown.
- 14. For undrained tests, a plot on axes of Average Cavity Strain/ Total pressure showing the results of curve fitting the field curve with the best set of parameters using a non-linear elastic/perfectly plastic solution (Whittle, '99).

If a drained test has been carried out:

- 15. Manassero, 1989 A plot of effective radial stress vs cavity strain, showing the loading curve with the loops removed.
- 16. Manassero, 1989 A plot of volumetric strain vs shear strain, loading and unloading data shown.
- 17. Manassero, 1989 A plot of the current mobilised friction and dilation angle vs shear strain, loading and unloading data shown.
- 18. Manassero, 1989 A plot of shear stress vs shear strain, loading and unloading data shown.
- 19. Manassero, 1989 A plot of stress ratio vs shear strain, loading and unloading data shown.
- 20. Manassero, 1989 A plot of shear stress vs normal stress, for both loading and unloading data. A line is plotted showing the peak angle of internal friction.

The following pages apply to all tests:

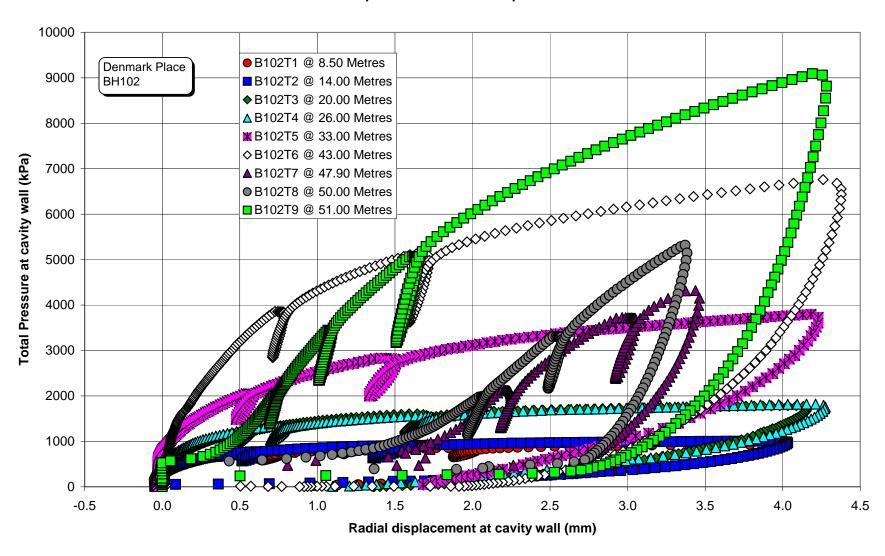
- 21. A handwritten test record sheet
- 22. From WINLOG On axes of Radial Displacement/Total Pressure showing average displacement.
- 23. From WINLOG On axes of Radial Displacement/Total Pressure showing all displacement sensors
- 24. From WINLOG On axes of Radial Displacement/Total Pressure showing the three pairs of displacement sensors.
- 25. From WINLOG On axes of Radial Displacement/Total Pressure showing two loading curves, the average of the odd numbered arms and the average of the even numbered arms.

Because the information presented here comes from a variety of sources it is not possible to number the pages in a coherent manner, although within a test some pages may be numbered.

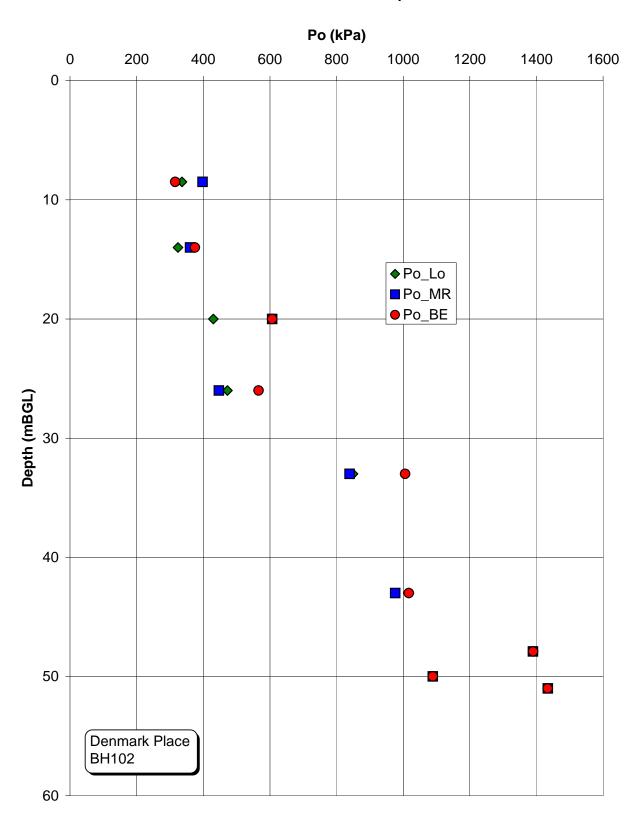
BOREHOLE BH102

RESULTS SUMMARY PLOTS

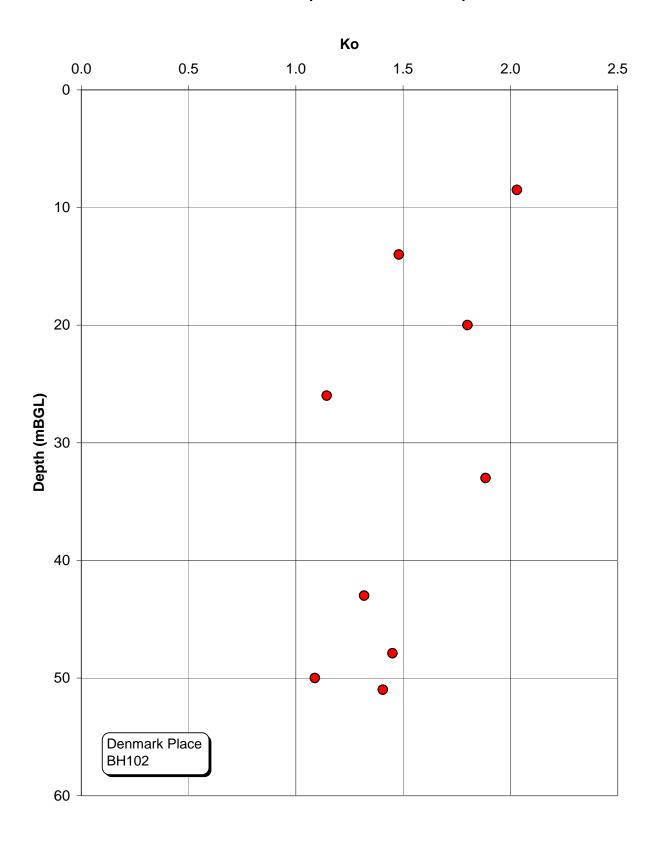
Total pressure vs Radial displacement



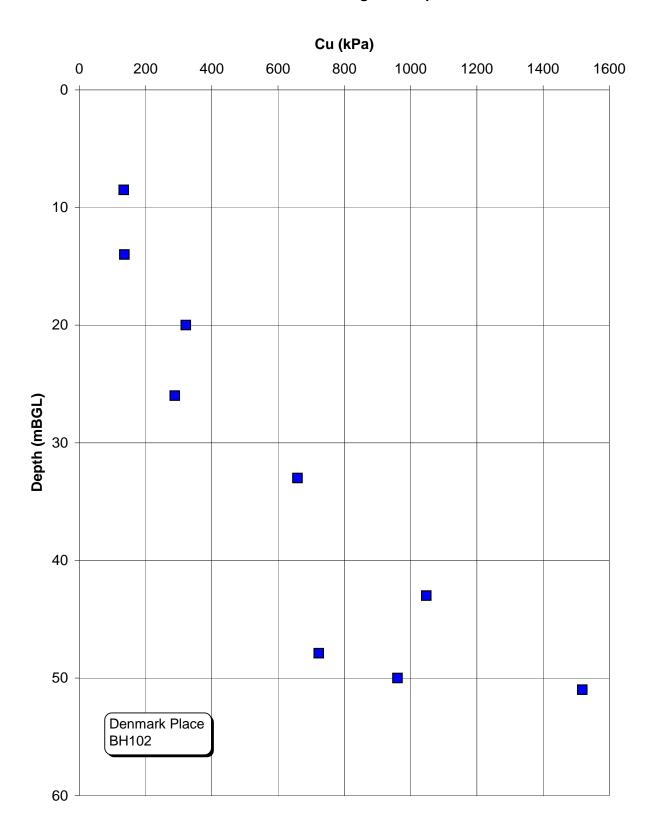
Insitu lateral stress vs Depth



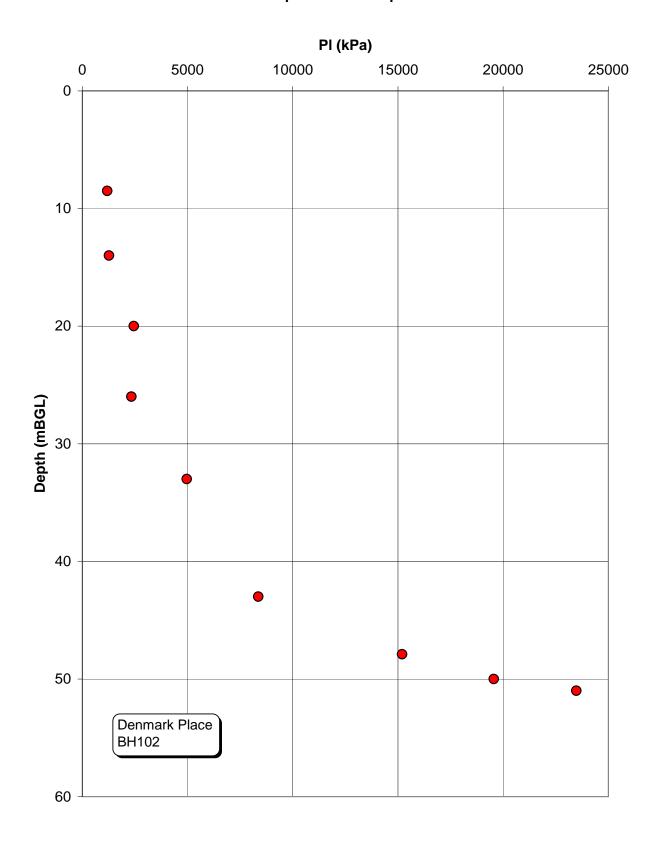
Coefficient of earth pressure at rest vs Depth



Undrained shear strength vs Depth



Limit pressure vs Depth



Yield stress vs Depth

